

WHAT IS CLAIMED IS:

1. Screw cap tightener apparatus comprising a turntable, a spindle mounted on the turntable to rotate relative thereto, a screw cap gripper head secured to the spindle,
5 and drive means to rotate the spindle by exerting an off-center drive force on the spindle, the apparatus further comprising means engaging a portion of the spindle that is stationary in rotation to detect a force applied in reaction to the drive force, and means for stopping
10 tightening, said means being connected to the detector means to stop tightening when the force applied in reaction exceeds a predetermined threshold.
2. Tightener apparatus according to claim 1, wherein the
15 spindle is mounted on the turntable with lateral clearance to be movable between a tightening position and an end-of-tightening position, and wherein the means for detecting the applied force comprises means for resiliently returning the spindle towards the tightening
20 position, and means for detecting the position of the spindle, the means for stopping tightening being connected to the position detector means in order to stop tightening when the spindle reaches the end-of-tightening position.
- 25 3. Tightener apparatus according to claim 2, wherein the spindle is mounted on the turntable via a guide element mounted on the turntable with lateral clearance so as to be movable between the tightening position and the end-
30 of-tightening position, and wherein the resilient return means is interposed between the turntable and the guide element.
- 35 4. Tightener apparatus according to claim 3, wherein the resilient return means comprises an arm having one end hinged to the turntable and an opposite end close to which the position detector means is mounted, and a

spring interposed between the turntable and the arm to maintain an intermediate portion of the arm bearing against the guide element.

5 5. Tightener apparatus according to claim 4, including a member for prestressing the spring, said member comprising a lever having a first end hinged on the second end of the arm, and a second end to which a first end of a rod passing through the arm is coupled, the rod
10 having a second end provided with a shoulder, the spring being disposed around the rod between the arm and the shoulder at the second end of the rod, and the lever being in abutment against an eccentric secured to the turntable in such a manner that the spring presses the
15 arm against the guide element, the eccentric being mounted on the turntable so as to be capable of being pivoted to adjust the angle between the lever and the arm.

20 6. Tightener apparatus according to claim 2, wherein the spindle is mounted to slide relative to the turntable during tightening, and wherein the apparatus includes additional guide means arranged to provide accurate guidance in sliding over a fraction of tightening, and
25 allowing movement corresponding to the lateral clearance at the end of tightening.

7. Tightener apparatus according to claim 6, wherein the additional guide means comprise two elements, one of
30 which is secured to the spindle and the other to the turntable, i.e. an element comprising a column having a first segment and a second segment, the first segment being greater in diameter than the second segment, and an element comprising a ring having in inside diameter
35 substantially equal to the diameter of the first segment and mounted to slide along the column.

8. Tightener apparatus according to claim 2, wherein the position detector means is an inductive detector.

5 9. Tightener apparatus according to claim 1, wherein the detector means comprises means for detecting a bearing reaction of the spindle.

10 10. Tightener apparatus according to claim 9, wherein the means for detecting the bearing reaction comprise a strain gauge.